WETPOND SIZING WORKSHEET

2005 Surface Water Design Manual Sizing Method

Project name: _____

METHODS OF ANALYSIS (see p. 6-68)

Step 1) Determine volume factor *f*.

Basic size? f = 3 Consult WQ requirements(Section1.2.8)

Large size? f = 4.5 to determine if basic or large size needed

Step 2) Determine rainfall *R* for mean annual storm.

Rainfall (R) _____ (feet) Required from Figure 6.4.1.A

Step 3) Calculate runoff from mean annual storm

$V_r = (0.9A_i + 0.25A_{tg} + 0.10A_{tf} + 0.01\ A_{og}) \times R$

A_i=	tributary area of impervious surface	_____	(sf)	Determine now
A_{tg}=	tributary area of till grass	_____	(sf)	Determine now
A_{tf} =	tributary area of till forest	_____	(sf)	Determine now
A_{og}=	tributary area of outwash grass	_____	(sf)	Determine now
R =	rainfall from mean annual storm	_____	(ft)	From Step 2
V_r =	volume of runoff from mean annual storm	_____	(cf)	

Step 4) Calculate wetpool volume

$V_b = f\ V_r$

f =	Volume factor	_____	(unitless)	From Step 1
V_r =	volume runoff, mean annual storm		(cf)	From Step 3
V_b =	Volume of the wetpool		(cf)	

Step 5) Determine wetpool dimensions

a) Determine geometry of first cell

Volume in first cell	_____	(cf)	25-35% of total
Depth ***h*** 1st cell (minus sed. stor.)	_____	(ft)	See Section 6.4.1.2

Determine horizontal xs area at mid-depth using Amid = V1st/h

Amid	_____	(sf)
Mid-width	_____	(ft)
Mid-length	_____	(ft)

Determine horizontal xs area at surface

Z = Side slope length: __(H): 1(V)	_____	(ft)	3:1 recommended
2(*h*/2 x Z) =	_____	(ft)	

Find top dimensions by adjusting for shape geometrics

Top width	_____	(ft)
Top length	_____	(ft)
A_{top} =	_____	(sf)

b) Determine geometry of second cell

Volume in second cell	_____	(cf)	Must be 65 - 75%
Depth ***h*** of 2nd cell	_____	(ft)	See Section 6.4.1.2
Determine horizontal xs area at mid-depth using $A_{mid} = V_{2nd}/h$			
A_{mid}	_____	(sf)	
Mid-width	_____	(ft)	
Mid-length	_____	(ft)	Used to check L:W
Determine xs-area at surface			
Z = Side slope length: __(H): 1(V)	_____	(ft)	3:1 recommended
2(*h*/2 x Z) =	_____	(ft)	
Top width	_____	(ft)	
T_{top} length	_____	(ft)	
A_{top} =	_____	(sf)	
Adjust cell 2 width to match cell 1	_____	(ft)	
Adjust cell 2 length using A_{top}	_____	(ft)	

Geometry check: overall pond L : W at mid depth = 3 : 1

Pond width (mid-depth)	_____	(ft)
Cell 1 length (mid-depth)	_____	(ft)
Cell 2 length (mid-depth)	_____	(ft)
Pond length (mid-depth) = cell 1 + 2	_____	(ft)
	_____	
Lmid : Wmid =	_____	

Step 6) Design rest of pond (see Criteria p. 6-72)

Internal berm
Inlet & Outlet
Primary overflow
Access
Other Design Details (Sections 6.2.2, p. 6-18, 6.2.3, p. 20 and 6.2.4, p. 6-22)
- Sequence of Facilities
- Setbacks
- Sideslopes, fencing, embankment
- Liners

Total wetland surface area estimate

Surface area 1st cell + 2nd cell + area for internal berm + area for access ramp

= _____
= _____
= _____ sf

Plus setbacks, access roads, 100-yr conveyance